

National Aeronautics and Space Administration



Ames Research Center
Moffett Field, California 94035

December 9, 2021

Julianne Polanco
State Historic Preservation Officer
Office of Historic Preservation
Department of Parks & Recreation
1725 23rd Street, Suite 100
Sacramento, CA 95816

Mark Beason
State Historian II
Office of Historic Preservation
Department of Parks & Recreation
1725 23rd Street, Suite 100
Sacramento, CA 95816

Subject: Section 106 Consultation for the MFA Hangar 1 Rehabilitation Project at NASA
Ames Research Center, Moffett Field, Santa Clara County, CA
(NASA_2020_0413_002)

Dear Ms. Polanco,

In support of its responsibilities under Section 106 of the National Historic Preservation Act of 1966 (NHPA), the purpose of this letter is for the National Aeronautics and Space Administration Ames Research Center (NASA ARC) to provide information to the State Historic Preservation Officer (SHPO) about revisions to the plans for the exterior rehabilitation of Hangar 1, located at Moffett Field, Santa Clara County, California.

On April 13, 2020, NASA ARC submitted a consultation letter and accompanying Technical Report for Phase I of the rehabilitation of Hangar 1, comprising abatement and recoating. On May 20, 2020, NASA ARC submitted a consultation letter and accompanying Technical Report for Phase II, comprising re-cladding, adaptive re-use, and structural strengthening. SHPO concurred that each phase of the project constitutes an undertaking for purposes of Section 106 of the NHPA. The two phases were reviewed concurrently, and SHPO concurred with NASA ARC's finding of no adverse effect for both phases on June 22, 2020.

As plans for the Hangar 1 rehabilitation have been further developed, the project scope has been modified to reflect an improved understanding of the Hangar's post-rehabilitation performance, the identification of constructability issues through the development of the Construction Documents and additional analysis, and the general refinement of programmatic requirements. Overall, the revised project proposes fewer interventions to historic fabric and all components have been designed to comply with the Secretary of the Interior's Standards for Rehabilitation (the "Standards").

Revised Project Description - Exterior Rehabilitation

The revised project includes the following changes to the exterior rehabilitation/re-cladding:

- Hangar 1 is constructed of steel truss frames on a battered concrete stem wall that runs the perimeter of the building. The previous project design noted that due to the apparent fair condition of the stem wall, it would be retained and repaired to the extent possible but anticipated that there could be areas where the existing fabric is deteriorated beyond repair and may need to be replaced. A subsequent conditions assessment has confirmed that the stem wall is in overall better condition than originally anticipated.¹ Therefore, it is possible for selective patch and repair as needed, and there are no sections of the stem wall that will need to be replaced.
- The previous project design included the retention and rehabilitation of the monitor walk at the apex of the roof, elevating it to provide the required clearance for the new roof below, installing non-combustible metal deck in lieu of the original wood planking, and raising the existing guard rails to meet current safety codes. After extensive study and evaluation of multiple alternatives with the architect, general contractor, structural engineer, and roofing subcontractor, it has been determined that it is not feasible to retain and reuse the existing monitor walk as originally proposed. Instead, the monitor walk will be removed prior to the installation of the new roof, and a compatible new monitor walk will be installed.

Raising the monitor walk as originally proposed would require cutting it into large segments, removing the segments by crane more than 200 feet to the ground, constructing a new substructure, and then lifting the segments by crane back onto the roof. The structural engineer has expressed concern that the condition of the galvanized metal likely will not withstand the disassembly, temporary relocation, and reinstallation. In addition, there are significant safety concerns associated with moving large steel components such a great distance on and off the roof. Finally, even if reassembly were possible, the existing historic fabric would need to be modified to meet current safety requirements regarding the height, spacing, and structural integrity of the guardrails.

It is not possible to leave the monitor walk in place during construction because there is insufficient space to install the new roof beneath the existing monitor. The new roofing system is several inches thicker than the historic roof to allow for the addition of insulation. As a result, there is insufficient clearance under the existing monitor framing for the installation of the new roof system, including the upturned boot flashings and counter flashings at framing penetrations that will provide protection from water infiltration. The roofing subcontractor will not warrant the new roof if installed beneath the existing monitor walk as it does not meet industry standards for minimum flashing heights. The new roofing system, including insulation, is a substantial improvement from the historic condition that will ensure long-term protection and usability of the historic Hangar.

Due to these circumstances, the existing monitor walk will be removed, and a new monitor walk will be constructed with a higher clearance above the roof. The new monitor will be in the same location as the original, and it will be designed to be compatible with the historic character of Hangar 1, with required updates to meet current codes. There will be no significant visual impact to the exterior of Hangar 1, as the roof monitor is more than 200 feet above grade and is not readily visible from the ground.

¹ Simpson Gumpertz and Heger, "Phase I Historic Materials Preliminary Conditions Assessment and Testing Report," July 22, 2021.

- The previous project design included enlarging the Tier Three windows on the airfield (east) side of Hangar 1 to increase solar heat gain in the building interior and provide additional natural light. However, with additional study of temperature and condensation issues within the Hangar, and revised programmatic requirements from an emphasis on an office/research and development use toward potential storage or light industrial uses, this modification to the historic condition is not required to meet performance goals. Anticipated condensation is minimal, particularly with the improved thermal performance provided by the new insulated roof and skin. Therefore, it has been determined that enlarging the windows is not necessary, and it is possible to replicate the historic size and configuration of the Tier Three windows. The east Tier Three windows will be replaced within the existing openings with the same new aluminum industrial window systems as the rest of the building. As a result, the east façade will be returned to its historic appearance, consistent with the overarching goal of the rehabilitation project.



Previous project design with enlarged Tier 3 windows on the east façade.



Revised project design with Tier 3 windows in original openings.

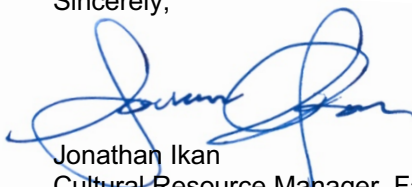
- The original scope of work included fixing the north clamshell door in a closed position and returning the south clamshell door to full operational condition. The revised project omits the full mechanical rehabilitation of the south clamshell door, as it is not needed to accommodate new uses within the Hangar. Instead, the trunnion pins will be rehabilitated so that the south clamshell door can be pushed into place. Both the north and south clamshell doors and the associated mechanical and structural elements of the operating machinery will be retained in place so that both doors can be returned to full mechanical operational condition in the future.
- The previous project design included new in-ground uplighting around the perimeter of the building and on the roof monitor which has been removed from the project scope. This lighting is an added feature that did not exist historically and was designed for aesthetic, not functional, reasons. The elimination of this lighting therefore has no impact on the historic character and integrity of Hangar 1.
- The previous project specified the installation of a new lightning protection system for the Hangar; this has been removed from the project due to the small likelihood of a significant lightning strike in the area. The building did not include a lightning protection system historically. The elimination of the lightning protection system therefore will have no impact on the historic character and integrity of the Hangar.

NASA ARC has determined that the revisions to the exterior rehabilitation project comply with the Standards and therefore upholds the finding of No Adverse Effect for the undertaking. NASA ARC requests your concurrence on its finding of No Adverse Effect related to the exterior rehabilitation, pursuant to 36 Code of Federal Regulations (CFR) 800.5(b). NASA ARC requests your response within 30 days of receipt of this letter, as specified in CFR 800.5(c).

Once the new use is confirmed for Hangar 1, NASA ARC will consult with SHPO on any significant modifications to the approved interior scope of work that affect interior character-defining features.

Please contact me if you have any questions.

Sincerely,



Jonathan Ikan
Cultural Resource Manager, Facilities Engineering Branch
NASA Ames Research Center, Mail Stop 213-8
Moffett Field, CA 94035
(605) 604-6859
Jonathan.d.ikan@nasa.gov

Cc:

Ms. Rebecca Klein, NASA FPO
Environmental Management Division
NASA Headquarters
300 E Street, SW
Washington, DC 20546-0001

Lease Administration Team
Planetary Ventures
1600 Amphitheater Pkwy
Mountain View, CA 94043

Legal Department/Legal Matters
Planetary Ventures
1600 Amphitheater Pkwy
Mountain View, CA 94043